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Heterotopic Pregnancy in spontaneous pregnancy after previous Assisted Reproductive Techniques (ART)

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ABSTRACT

Heterotopic pregnancy (HP) is a rare condition, particularly in spontaneous pregnancies that follow assisted reproductive techniques (ART). This case report describes a 33-year-old female from Saudi Arabia, who is Gravida 2, Para 0+1. She conceived spontaneously after a history of male-factor azoospermia in her first marriage. An ultrasound examination showed the presence of two gestational sacs (GS) - one located in the uterus and the other on the left ovary, which confirmed the diagnosis of heterotopic pregnancy. The patient then underwent an exploratory laparotomy with salpingostomy, which successfully managed the ectopic pregnancy. This case highlights the challenges involved in diagnosing and managing heterotopic pregnancies, particularly in the context of previous ART.

Keywords: Hetertopic pregnancy, assisted reproductive techniques

1. INTRODUCTION

Heterotopic pregnancy (HP) is a rare condition where a woman has both an intrauterine and ectopic pregnancy at the same time, with the ectopic pregnancy most commonly located in the Fallopian tubes. While spontaneous HP is rare (1 in 30,000), the rate increases to 1 in 100 in pregnancies resulting from in vitro fertilization (IVF) (Zheng et al., 2023). This case highlights the unique nature of HP in a spontaneous pregnancy following ART, and emphasizes the importance of careful diagnosis and management.

2. CASE PRESENTATION

This case involves a 33-year-old Saudi female, gravida 2, para 0+1, with a last menstrual period recorded on 24.5.1444, an estimated due date of 9.3.1445, and a gestational age at presentation of 4 weeks and 5 days. The patient presented to our emergency department with a one-day history of vaginal bleeding and mild lower abdominal pain. Vaginal bleeding was minimal, with no passage of tissue noted. Per vaginal examination revealed spotting, and the cervical os was found to be closed. Bedside ultrasound examination demonstrated the presence of two gestational sacs (GS), one intrauterine and the other located on the left ovary. The patient's initial admission revealed a beta-human chorionic gonadotropin (BHCG) level of 5300. Subsequent ultrasound examinations disclosed an intrauterine gestational sac (IUGS) measuring 9mm with a discernible yolk sac. Adjacent to the left ovary, another small mass gestational sac measuring approximately 15*12mm was identified, accompanied by two corpus luteum formations.

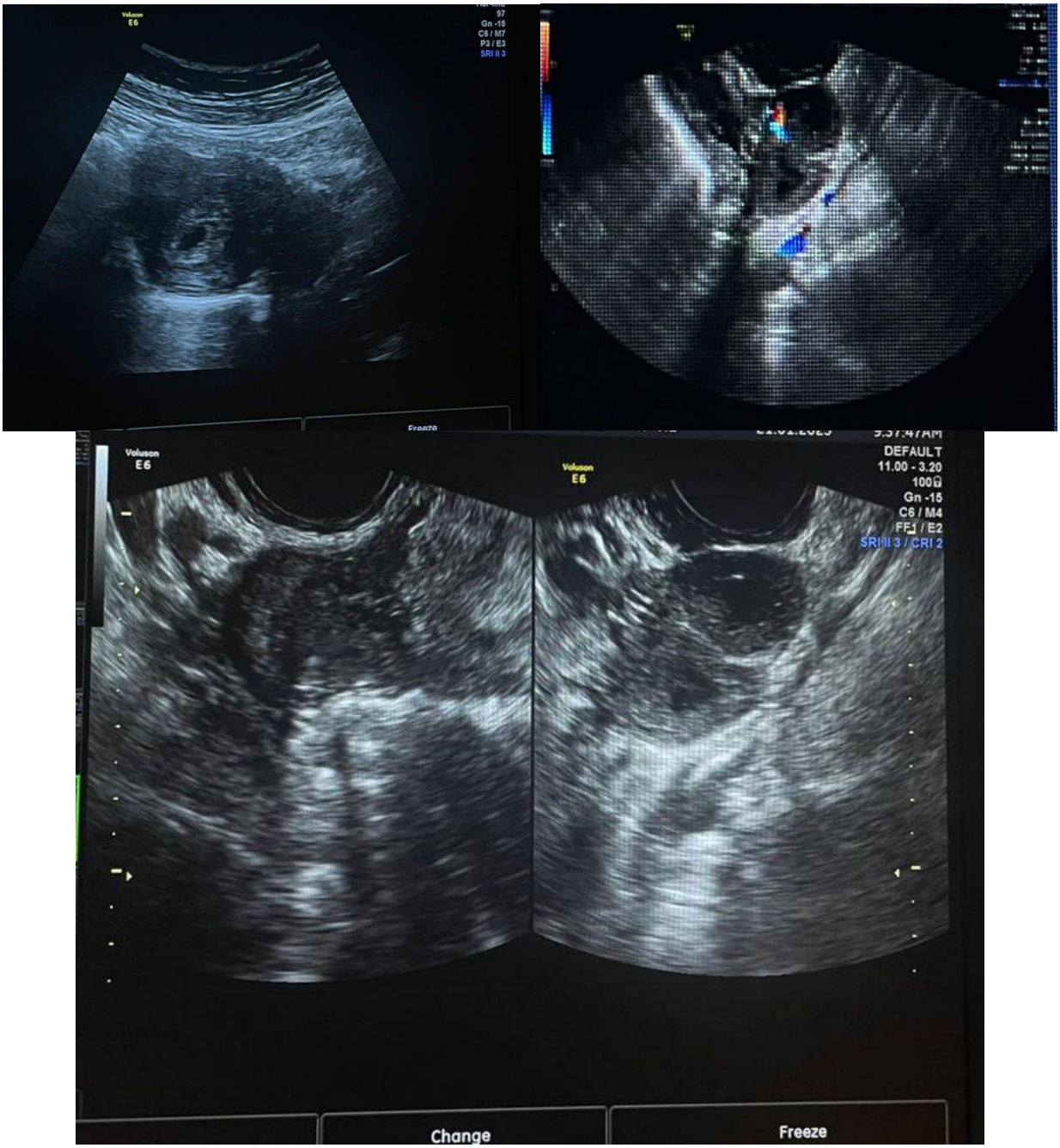

Figure 1 Transvaginal ultrasound **-** intrauterine elongated gestational sac

This patient, in her second marriage of two months duration, conceived spontaneously, confirming her pregnancy through a home urine pregnancy test six days after a missed menstrual period. Unfortunately, she subsequently developed vaginal bleeding, prompting her presentation to the emergency department. In her previous 11-year-long marriage, infertility was attributed to male-factor azoospermia, with three attempts at in vitro fertilization (IVF) resulting in conception on the third occasion. Regrettably, this pregnancy concluded in a missed abortion during the first trimester, necessitating surgical intervention following unsuccessful medical management. The patient has a regular menstrual cycle that lasts for five days every 30 days. She does not suffer from dysmenorrhea or menorrhagia, and her medical history indicates that she has never had any sexually transmitted diseases (STDs) or pelvic inflammatory disease (PID). She has never used any contraceptives or intrauterine devices (IUDs).

The patient is a housewife with a bachelor's degree, and her spouse is employed as a paramedic. After the diagnosis was confirmed through a second ultrasound, the patient was informed about her condition, the treatment plan, and the impact on her future fertility. She then underwent a minimally invasive exploratory surgery, which revealed an ectopic pregnancy located in the left fallopian tube. The issue was addressed through salpingostomy. Following the surgery, the patient experienced mild discomfort but remained stable. On the second day after the surgery, a follow-up ultrasound showed an intrauterine gestational sac measuring 1.5cm but no fetal pole was detected (Figure 1). A further follow-up after two weeks is planned. This case presentation offers a detailed account of a heterotopic pregnancy that occurred spontaneously following ART, including the patient's demographic, clinical, and obstetric history. There is a left adnexal complex lesion containing rounded thick-walled echogenic structure; Doppler study revealed a ring of fire appearance, likely a picture of left ectopic pregnancy.

3. DISCUSSION

Heterotopic pregnancy is a rare condition that can present with various symptoms, making it difficult to diagnose. Clinicians should consider the possibility of heterotopic pregnancy in patients who experience vaginal bleeding and adnexal pain, particularly those with a history of infertility or assisted reproductive technology (ART) (Elsayed et al., 2023). Management options for heterotopic pregnancy include minimally invasive procedures to ensure the safety of the intrauterine pregnancy. This case study adds to the existing literature by highlighting the unique aspects of heterotopic pregnancies in spontaneous conceptions following ART. Heterotopic pregnancy can be difficult to diagnose, and clinicians should keep it in mind as a possible diagnosis in certain clinical scenarios. Patients presenting with vaginal bleeding, along with adnexal swelling and abdominal pain, should be considered for this condition, especially those with a history of infertility, assisted reproductive techniques (ART), or other risk factors for ectopic pregnancies. It is crucial to consider heterotopic pregnancy as a possible diagnosis to ensure prompt and appropriate treatment (Tulandi, 2015).

It is important to note the unique context of this case, where a heterotopic pregnancy occurred in a spontaneous conception after previous ART (Teka et al., 2023). Although heterotopic pregnancies are more commonly associated with ART, this case adds complexity to the diagnostic and management aspects due to its occurrence in natural conception. It highlights the need for heightened awareness among clinicians in recognizing heterotopic pregnancies, even in seemingly low-risk situations (Teka et al., 2023). Research on heterotopic pregnancies indicates that they are more common in cases of assisted reproductive technology (ART) and less frequent in natural conceptions. Aziz and Arronte, (2020) the challenge with these pregnancies is that they are rare in natural conceptions, which can lead to delays in diagnosis and treatment. Early detection through imaging techniques like ultrasound is essential, but there are still cases where diagnosis is uncertain, as seen in this report.

This case challenges conventional norms by presenting a spontaneous heterotopic pregnancy that occurred without assisted reproduction. Due to a family history of multiple gestations, it is important to explore genetic and familial factors. The rarity of this case emphasizes the crucial need for practitioners to be vigilant in symptomatic cases, potentially saving lives through early diagnosis. The loss of the desired intrauterine pregnancy was unexpected and highlights the urgency for timely intervention to mitigate both fetal and maternal risks. This case provides a unique perspective on the early detection and effective management of heterotopic pregnancies. It contributes to ongoing discussions on this topic and prompts a reevaluation of risk factors, advancing insights for clinicians. The study presented a rare scenario of heterotopic pregnancy in a spontaneous conception, which expands our understanding of diagnostic challenges and management considerations in such cases (Abdelmonem et al., 2021; Aziz and Arronte, 2020).

The evidence presented is consistent with the current body of knowledge on heterotopic pregnancies, emphasizing the importance of a high index of suspicion and prompt intervention, particularly in cases of spontaneous pregnancies following ART. Upon connecting the case to the existing literature, it becomes clear that this report supports the current understanding of heterotopic pregnancies, highlighting the importance of being watchful in clinical practice. The case demonstrates the complexity of diagnosing heterotopic pregnancies in spontaneous conceptions and emphasizes the significance of considering this condition even in situations that appear to be low-risk. Heterotopic pregnancies (HP) present a diagnostic challenge, manifesting with severe clinical conditions like tubal rupture, acute abdomen, and hemoperitoneum. The variability in symptoms, including those mimicking a threatened miscarriage, complicates early diagnosis. Heterotopic pregnancies (HP) can be difficult to diagnose and often result in severe clinical conditions such as tubal rupture, acute abdomen, and hemoperitoneum.

The symptoms of HP can be varied and may mimic those of a threatened miscarriage, making early diagnosis challenging. Traditional methods of diagnosis, such as β-hCG doubling time and discriminatory zones, are often less effective in HP cases, leading to delayed diagnosis and ruptures. Medical literature has emphasized the importance of abdominal pain, peritoneal irritation, and an enlarged uterus in HP diagnosis. The diagnostic accuracy of serum β-hCG levels, which indicate both intrauterine and extrauterine pregnancies, is not very precise. It is uncommon to see both fetal heart activities, and sometimes, misdiagnosis as a corpus luteum cyst can further complicate the diagnosis (Hirschler and Soti, 2023). Doppler ultrasound, particularly the 'ring of fire' sign, is helpful, as shown in our case. Although ultrasound is the primary imaging method used, MRI can be used in some cases as a supplementary technique to improve diagnostic accuracy in ectopic and HP pregnancies.

This highlights the various diagnostic challenges in HP cases and underscores the need for a nuanced approach and the use of adjunct imaging techniques for accurate and timely diagnoses. The evidence presented in this case is valuable for improving future clinical practice. It highlights the importance of carefully considering heterotopic pregnancies in patients with a history of infertility and previous assisted reproductive technology (ART). This case emphasizes the significance of early diagnosis and minimally invasive management options to ensure the safety of the intrauterine pregnancy. The evidence gathered from this case can be used by clinicians to improve their approach when dealing with similar cases. This can lead to better outcomes for patients experiencing heterotopic pregnancies in different reproductive contexts. Considering the unique nature of this case and how it aligns with existing literature, it can be considered a valuable contribution to the field and is justified for publication.

4. CONCLUSION

This case report highlights the significance of considering heterotopic pregnancy in patients who have a history of infertility or ART. Timely intervention is crucial, as demonstrated by the successful management via exploratory laparotomy with salpingostomy. Clinicians should remain vigilant in recognizing the diagnostic challenges posed by heterotopic pregnancies. This case provides valuable insights into existing literature and can guide future clinical practice.

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Author Contributions

Tahani Mohammed Aljuhani: Supervisor

Ghofran Saleem Alhejaili and Mohand Ebrahim A Nooli: Design case report conception and wrote the case presentation

Daliyah Abdulhamid Alqulaiti and Shahad Saud Aljohani: Data collection and wrote the discussion

Lubna Ahmed Murtada and Renad Mohammed Alsaedi: Draft manuscript Preparation and wrote discussion

All authors reviewed the case and approved the final version of the manuscript.

Informed consent

Written & Oral informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

Ethical approval
Not applicable.

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Conflict of interest
The authors declare that there is no conflict of interests.

Data and materials availability
All data sets collected during this study are available upon reasonable request from the corresponding author.

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